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# CRYPTOLOG

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"The General Staff is the main organ of control of the armed forces of the state in peace and wartime." That is the first sentence of the article on the General Staff in *Sovetskaya voennaya ehntsiklopediya* (Soviet Military Encyclopedia), published in 1976. The article was written by General of the Army V. G. Kulikov during his tenure as Chief of the General Staff (September 1971 to January 1977). Kulikov has been reassigned to the position of Commander-in-Chief of the Combined Armed Forces of the Warsaw Pact and promoted to Marshal of the Soviet Union. His successor as Chief of the General Staff is N. V. Ogarkov, who was also promoted to Marshal of the Soviet Union.

In this article we shall examine the role of the Soviet General Staff

<sup>2</sup>Italics are used throughout this article to indicate Russian abbreviations and words.

tary Council of the Republic (8 November 1918 renamed Field Staff of the Revolutionary Military Council of the Republic), the functions and composition of the All-Russian Main Staff were changed. Chiefs of Staff (the Field Staff) of the Revolutionary Military Council of the Republic were:

. N. I. Rattehl'	Sep 1918 - Oct 1918
. V. F. Kostyaev	Oct 1918 - Jun 1919
. M. D. Bonch-Bruevich	Jun 1919 - Jul 1919
. P. P. Lebedev	Jul 1919 - Feb 1921

In February 1921, for purposes of establishing a single organ of control of the Armed Forces of the RSFSR, the All-Russian Main Staff and the Field Staff were combined into the Staff of the RKKA (Workers and Peasants Red Army), the Chief of which from February 1921 until April 1924 was P. P. Lebedev. Subsequently, in conducting the military reforms of 1924-1925 the position and role of the Staff of the RKKA in leading the Soviet Armed Forces became determined more clearly. M. V. Frunze (Chief of the Staff of the RKKA from April 1924 until January 1925) emphasized that "this operational staff must become not only the brains of the Red Army, but must also become the military brains of our entire Soviet state." The Staff of the RKKA actively participated in the preparation of the country and armed forces of the USSR for military defense against imperialistic aggression. It was charged with the working out of operational and mobilization plans, keeping in mind the political, economic, and military resources of the Soviet state, the conducting of activities on questions of organizing the equipping of the army, aviation, and navy, the operational use in war of the services of the armed forces, arms of service, and special troops and their further development. The Staff became the center for studying and summarizing the combat experience of World War I and the Civil War. After M. V. Frunze, the Staff of the RKKA was headed by:

. S. S. Kamenev	Feb 1925 - Nov 1925*
. M. N. Tukhachevskij	Nov 1925 - May 1928
. B. M. Shaposhnikov	May 1928 - Jun 1931
. A. I. Egorov	Jul 1931 - Sep 1935

\*After leaving his position as Inspector of the RKKA

In the 1930s the tasks of strengthening the defense of the country demanded further perfection of the organs of higher military control. In June 1934 the Revolutionary Military Council of the USSR was abolished by the TsIK (Central Executive Committee) of the USSR and the People's Commissariat for Military and Naval Affairs was renamed the People's Commissariat of Defense of the USSR. The Staff of the RKKA, by decision of the SNK (Council of People's Commissars) of the USSR, dated 22 September 1935, was transformed into the General Staff of the RKKA. It was composed of the following directorates:

#### Encyclopedia Article

The translation of the pertinent portion of the encyclopedia article follows:

The first main military organ in the history of the Soviet state which led the formation, equipment and instruction of the troops of the Soviet Army, and also the working out of all questions connected with defense of the Republic was the All-Russian Main Staff, which was established in May 1918. A council consisting of a Chief and two military commissars, which until 6 September 1918 was subordinate to the People's Military Commissars (*Narkomvoen*) and then to the Revolutionary Military Council (*Revvoensovet*) of the Republic, headed the Staff. Chiefs of the All-Russian Main Staff were:

. N. N. Stogov	May 1918 - Jun 1918
. A. A. Svechin	Aug 1918 - Oct 1918
. N. I. Rattehl'	Oct 1918 - Jun 1920
. A. A. Somojlo	Jun 1920 - Feb 1921

In connection with the fact that the organ of operational leadership from 6 September 1918 had become the Staff of the Revolutionary Mili-

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- . operations,
- . intelligence,
- . organizational,
- . mobilization,
- . military-topographic,
- . military transportation,
- . organization of the rear, and
- . a number of other directorates and departments.

In the prewar years the General Staff was occupied with strategic and operational planning for the utilization of the USSR armed forces in war and operations, the studying of the preparation of the theaters of military operations, perfecting of the organizational structure of forces, mobilization questions, material-technical support and plans for orders of armaments and equipment from industry, directing of operational training of the higher command complement and operations staff, and the working out of questions of Soviet military theory. A major task of the General Staff was supporting a high level of combat readiness of forces and staffs. The development of centers of conflict and the emergence of a direct threat of attack on the USSR demanded that the Communist Party and the Soviet government hasten the carrying out of a number of major measures connected with strengthening the nation's defense capability. A great role in the organization and leadership of these measures was played by the General Staff. Prewar Chiefs of the General Staff were:

- . Marshal of the Soviet Union  
A. I. Egorov Sep 1935 - May 1937
- . Marshal of the Soviet Union  
B. M. Shaposhnikov May 1937 - Aug 1940
- . General of the Army  
K. A. Meretskov Aug 1940 - Jan 1941
- . General of the Army  
G. K. Zhukov Feb 1941 - Jul 1941

At the beginning of the Great Patriotic War [World War II] the General Staff was subordinated to the Supreme High Commander and was a principal operational working organ of the *Stavka* (Headquarters) of the Supreme High Command for strategic planning and directing of the armed forces at the fronts. The General Staff:

- . carried out the collection and analysis of data about the situation at the fronts;
- . prepared conclusions and proposals to the *Stavka*;
- . on the basis of decisions made by the *Stavka*, worked out plans for campaigns and strategic operations;
- . organized strategic interaction of the services of the armed forces and fronts;
- . monitored the working out of plans of frontal operations;
- . informed the troops of decisions, orders, and directives of the Supreme High Command, and checked on their fulfillment;
- . directed military intelligence;
- . organized and checked on the operational transportation of troops;

- . monitored the formation of reserves and the timeliness of their utilization in accordance with decisions of the *Stavka*;
- . looked after the condition, support, and combat readiness of the troops;
- . generalized the experience of the war and informed the troops of it;
- . together with other organs of the People's Commissariat of Defense, worked out and submitted requisitions for the output of military production in accordance with the strategic plans outlined by the *Stavka*; and
- . decided many other questions connected with the conducting of the war.

Particular attention in the work of the General Staff was given to maintaining constant communications with the commanders of forces of the fronts, commanders of fleets and their staffs, and also organizing checks on the fulfillment by the troops of directives and orders issued by the Supreme High Command. Representatives of the General Staff often traveled to the fronts for purposes of rendering assistance to the troops. In the combat Army, from division to the front staff inclusive, there were constantly officers of the General Staff, who checked on the position and condition of the troops, their supply situation, training of troops for operations, and their carrying out of combat missions in the course of military operations, and reported about this to the General Staff.

The work of the General Staff in generalizing the experience of combat operations was of great importance. For this purpose a Department for Utilization of the War Experience was established within the General Staff. In the autumn of 1942 the first "Collection of Materials Concerning the Study of the War Experience" was published. In March 1944 the department was expanded into a directorate, which, along with the earlier publications, organized publication of "Information Bulletins" and "Collections of Tactical Examples." The publishing in 1944 alone of approximately 600,000 copies of various publications on these questions testifies to the scope of the work done by the General Staff in generalizing and utilizing the experience of the war. The preparation of proposals, reports, and materials on all military questions discussed in the course of governmental meetings and international conferences of the nations forming the anti-Hitler coalition, became one of the responsibilities of the General Staff in the course of the war. The General Staff was staffed with officers and generals who knew well the nature of contemporary warfare, the potentialities of the services of the armed forces and the arms of service, mastered skills of planning contemporary operations, possessed broad operational vision, flexible operational thinking, and high military efficiency, as well as a large amount of combat experience. After General of the Army G. K. Zhukov, the Chiefs of the General Staff during the war years were:

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- . Marshal of the Soviet Union  
B. M. Shaposhnikov Jul 1941 - May 1942
- . General Colonel, from 18  
January 1943 General of  
the Army, from 16 Feb-  
ruary 1943 Marshal of  
the Soviet Union  
A. M. Vasilevskij May 1942 - Feb 1945
- . General of the Army  
A. I. Antonov Feb 1945 [to end  
of war]

After the end of the Great Patriotic War a reorganization of the higher organs of military control was conducted in accordance with the conditions of peacetime. The General Staff was subordinated to the Ministry of Defense. Beginning in June 1946, it began to be called the General Staff of the USSR Armed Forces. Chiefs of the General Staff after the Great Patriotic War were:

- . General of the Army  
A. I. Antonov [1945] - Mar 1946
- . Marshal of the Soviet Union  
A. M. Vasilevskij Mar 1946 - Nov 1948
- . General of the Army  
S. M. Shtemenko Nov 1948 - Jun 1950

In 1950 the USSR Ministry of the Armed Forces was renamed the USSR Military Ministry, and the USSR Naval Ministry was formed. As a result, from 1950 to 1953 the Naval General Staff functioned, and the General Staff of the Armed Forces was renamed the General Staff of the Soviet Army in 1950. The General Staff of the Soviet Army was headed by:

- . General of the Army  
Shtemenko Jun 1950 - Jun 1952
- . Marshal of the Soviet Union  
V. D. Sokolovskij Jun 1952 - Sep 1955

In September 1955 the General Staff of the Soviet Army was reorganized into the General Staff of the USSR Armed Forces, Chiefs of which were:

- . Marshal of the Soviet Union  
V. D. Sokolovskij Sep 1955 - Apr 1960
- . Marshal of the Soviet Union  
M. V. Zakharov Apr 1960 - Mar 1963
- . Marshal of the Soviet Union  
S. S. Biryuzov Mar 1963 - Oct 1964
- . Marshal of the Soviet Union  
M. V. Zakharov Nov 1964 - Sep 1971

Since 1971 the General Staff has been headed by General of the Army V. G. Kulikov. Since March 1973 the Chief of the General Staff is simultaneously a First Deputy Minister of Defense of the USSR.

In the postwar period the General Staff has been perfecting its organizational structure and work methods, ensuring the coordinated work of the Main Staffs of the services of the armed forces, the Staff of the Rear, the Staff of USSR Civil Defense, Chief and Central Directorates of the Ministry of Defense, Staffs of Military Dis-

tricts, Groups of Forces, Air Defense Districts, and Fleets. The subsequent development of science and technology, and fundamental changes in the means, nature, and methods of conducting contemporary warfare have advanced the role of the General Staff in ensuring the reliable defense of the Soviet state, and have expanded and complicated the substance of its missions. The General Staff comprehensively analyzes and evaluates the military-political situation taking shape, determines the tendencies of development of the means of conducting warfare and the methods of their application, organizes training of the armed forces and execution of measures necessary for ensuring their high combat readiness to repulse any potential aggression. The further development of military theory occupies an important place in the activities of the General Staff. It directs military-scientific work, prepares major documents that prescribe regulations and deal with vital problems of Soviet military science, and inculcates its achievements in the practice of operational and combat training of troops and staffs. The combination of the restored centralization of leadership with regard for the initiatives of the subordinate organs of control, a high degree of readiness in the face of the necessity to switch over immediately to fulfilling wartime functions, and the scientific validity of the proposals and prepared decisions, are characteristic of the work of the General Staff. The widespread adoption of scientific organization of labor and of mathematical methods in the work of the General Staff, and the development of automated systems for controlling weapons and troops, permit the General Staff to resolve more effectively the complex problems involved in directing the armed forces in peace and wartime.

The General Staffs (or organs corresponding to them) of other socialist countries play an important role in the direction of the armed forces. Unlike the General Staffs of the imperialistic states, which are instruments of reactionary aggressive policy, the General Staffs of the socialist countries stand on guard, protecting the socialist achievements of their people. As in the USSR, they are organizationally a part of the Ministries of Defense (National Defense). The structure, role, and place of the General Staff in the system of military control ensure effective solution of all tasks concerning the training of national armed forces and permit directing their military operations in repulsing potential imperialistic aggression. For coordination of the activities of the Combined Armed Forces of the member states of the Warsaw Pact, a Staff of the Combined Armed Forces of those states has been established. (U)

*(Translated text within double lines, unclassified; introductory analysis, TSC)*

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# HAS IT EVER BEEN TRANSLATED BEFORE?

(TRACKING DOWN  
TECHNICAL TRANSLATIONS)

H218

**W**hat would you do if you had what seemed to be an important book or magazine article in a language you couldn't read? How would you find out whether the book or article had been translated into English, and, if it had been, where you could get a copy of the translation?

Foreign-language books and articles contain a great deal of information important to the NSA researcher or analyst. Regular research and state-of-the-art questions can often be answered by reading reports by scientists and engineers working in other countries.

Since no one person can hope to be able to deal with all the languages in which valuable information might be published, translations are an important research source at NSA.

## Who to Call at NSA

Now, then, how do you find a translation? Within the Agency, the major point of contact is T1213 -- the STINFO (Scientific-Technical Information) Services work center of the Library (Room 2N090, 5759s). This is the element responsible for locating a translation, if one exists. The Reference Collection in the Main Library, T1212/R (Room 2C051, 4169s) has some sources, such as commercial publications of indexing and abstracting services, and microfiche of the material translated by the U. S. Joint Publications Research Service (JPRS) and the Foreign Broadcast Information Service (FBIS). The Collateral Management and Product Repository, T124 (Room 2E040, 5669s) can often supply a document if the document serial number is known.

Even if a translator or translation service is immediately available, getting a book or magazine article translated can often be very time-consuming. Moreover, it can also be very expensive. One author estimates that a translation can cost up to 100 times the price of obtaining the original. A reason for this is



ST. JEROME IN HIS STUDY, an engraving by the German artist Albrecht Dürer. Jerome, a biblical scholar of the fourth and fifth centuries, translated the Bible into Latin. His version, known as the Vulgate, is based on earlier Latin translations and on Greek and Hebrew sources. The lion is Jerome's symbol.

that the translator must be skilled in the subject matter of the document being translated, as well as skilled both in the "source" language (the original, or "from") language and the "target" (the desired, or "into") language. Because of the high cost, and because of the time and effort involved, no one wants to translate something that has already been translated.

## Who Translates Foreign Literature?

Many organizations translate. JPRS is one of the major translation services in the U.S. government. It provides translations in many different languages and subject fields, and its products are well indexed. The translations are unclassified, although some are for government use only. The Air Force's Foreign Technology Division (FTD) translates in the scientific and technical realm. Plenum Publishing Corporation, Allerton Press, and Scripta Technica, Inc. are three commercial U.S. firms involved in translations. The American Institute of Physics does a number of translations of journals, as does the Optical Society of America.

Some translation agencies, whether U. S. government or commercial, publish cover-to-cover

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translations of each issue of certain foreign scientific-technical journals. Other translation agencies, including commercial ones listed in the yellow pages all around the country, translate, on a contract basis, individual monographs, individual issues of a journal, individual articles, etc.

Strictly speaking, however, it is not the "translation agencies" that do the translating, but translators -- human beings. Some U. S. government and commercial agencies keep a small staff of permanent, "in-house" translators, but most of them rely heavily upon part-time, "contract" translators who provide translations as needed. Most in-house or contract translators are anonymous, but there is also a large number of "free-lance" translators, listed in various directories by their country of residence and by the foreign languages and technical areas they are competent in.

With the large number of government and commercial translation agencies, and the large number of translators, it is easy to see that the field is big and confused. And bibliographic control, or having things organized so that you can find what you're looking for, is far from perfect. In fact, it is hardly adequate. But there are some approaches to the problem.

#### Cover-to-Cover Translations

For the purpose of looking for a translation of a particular article, translations can be divided into two groups: ad hoc and cover-to-cover. Many articles are translated on an ad-hoc basis. That is, they are translated when someone wants a translation of just that particular foreign-language article. For some of the more important foreign scientific journals, however, there is a different approach. About 200 of these journals, mostly Soviet, are translated in entirety each time they are issued. These are the "cover-to-cover" translations. NSA subscribes to a number of the translations (as well as the foreign-language originals). Some are translated by commercial firms, and others are sponsored by professional organizations. Some are commercially viable, and others are heavily subsidized by the U. S. government. As a rule, the translated journals have the same date and volume and issue numbers as the original, which makes matching the original with its translation easier. The main problem with cover-to-cover translations is the time lag between the publication of the original and the appearance of the English translation: the lag can be anywhere from several months to more than a year.

There are several different ways to find out if a particular foreign journal is one of those translated cover-to-cover. The specialized indexing and abstracting services list journals included in their publications, and several of these lists, like those in *Mathematical Reviews* or *Science Abstracts*, indicate which journals are translated and what the English title is. Also, various lists of cover-to-cover translations are

available. Since the field is so fluid, with translations beginning and ending all the time, these lists go out of date quickly. The International Translation Centre, which will be mentioned again later, regularly publishes a book called *Translations Journals* that includes this cover-to-cover information. *Translations Journals* also lists periodicals that have translations of articles from more than one source, and those periodicals that are originally published in various language editions. The book is available in the Pl6 Language Library (Room 3W076).

A somewhat less useful source of information on cover-to-cover translations is *Ulrich's International Periodicals Directory*. Ulrich's lists the source title in the case of a journal that is a translation, but there is no cross reference from the foreign-source title to the title of the cover-to-cover translations. A copy of Ulrich's is available in T1211 (Room B5113, FANX-III), and is also available in the Main Library (Room 2C051).

#### Ad Hoc Translations

Except for the time lag, articles that are published in journals translated cover-to-cover are no problem to track down. If you wait, the translation will eventually appear. The ad hoc translations -- those articles that were translated because someone wanted only them, rather than the entire journal -- are a completely different matter. They have to be tracked down, and the searcher usually isn't sure that what he's looking for even exists: maybe the article never *was* translated. We have several places here in the Agency where we can check, however, and they cover most of the possibilities.

One source of translation information that is available to government agencies is the Consolidated Translation Survey (CTS), housed at FBIS. CTS is a file of information on translations which are over five pages long and which were produced by U.S. government agencies and some commercial firms. The file includes all JPRS translations, limited distribution or not, that are over five pages long. The CTS coverage of other organizations depends on what they choose to report, although FBIS personnel say they seem to report most of what they translate. In the case of long translations, like books, CTS also lists things that are in process. This can prevent someone's starting a long and expensive translation of something that another agency might have close to completion. Items in the file are retrievable by author and original source title. FBIS doesn't stock copies of the documents, but will tell the requester how to get one. For security reasons, NSA doesn't input translations to CTS.

Commercial indexing and abstracting services are another access point for some translations. Most specialized indexing and abstracting services include items from foreign journals. The abstracts are usually in English, no matter what language the original

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article was in, and in many cases the entry for a particular article notes the availability of translations or summaries in English. Sometimes a researcher doesn't actually need to read the translation of a whole article. Depending on how detailed it is, a summary or the abstract itself may contain enough information for the researcher. To make the lookup process easier, many abstracting services are now available as files in commercial on-line computer systems. NSA subscribes to one such system, Lockheed's DIALOG. The records are usually retrievable by author, source title, and subject, although specific details vary from one file to another.

In addition to the commercial abstracting services, DIALOG has another file that includes some translations. This is the National Technical Information Service (NTIS) file. NTIS is a clearinghouse for unclassified government reports and publications releasable to the general public. The translations listed include JPRS material. The same information can also be found in the hard-copy *Government Reports Announcements and Index* (GRA&I). The machine file available through DIALOG goes back to 1964.

Another data base NSA can access is CIRC II, which replaced a system called CIRCOL. CIRC (Central Information Retrieval and Control) is located at Wright-Patterson AFB, Ohio, and is a file of intelligence information that meets the needs of:

- the Air Force's Foreign Technology Division (FTD);
- the Army's Foreign Science and Technology Center (FSTC);
- the Naval Intelligence Support Center (NISC);
- the Medical Intelligence Information Agency (MIIA); and
- the Missile Intelligence Agency (MIA).

CIRC II emphasizes science and technology.

One of the files available through CIRC II -- XLAX -- is devoted exclusively to scientific-technical (S&T) translations. According to the CIRC manual, the primary use of XLAX is to determine whether a particular document has been translated.

Yet another on-line indexing system we can use is the Defense Research, Development, Test and Evaluation On-Line System of the Defense Documentation Center (DDC). DDC stores research and development information prepared and submitted by contractors working on Defense Department-related projects. There is also a hard-copy index to this material, the *Technical Abstract Bulletin* (TAB). The machine system has the same information as is listed in

TAB. The documents in the DDC indexes, both the machine system and the hard-copy TAB, can be classified up through SECRET.

These machine systems -- DIALOG, CIRC II, and STINFO -- are all accessible through STINFO Services (Room 2N090, 5759s). The hard-copy indexes, for systems that have them, are also there.

So far we have dealt primarily with translations of journal articles, and of course the Agency is very interested in journal articles. New developments appear in journals first; it may be several years before a book is published on the subject. But journal articles aren't the only things that are translated.

#### Translations of Books

Books are often translated. One way we have to find information on translations of books is through the Ohio College Library Center (OCLC). OCLC is a data base of shared library cataloging information accessible through T1211. Translations entered into the system include the source title and are often accessible by way of both the original title and the translated title. The data base can also be queried with an author/title combination and, during certain hours, by author's name only.

The *National Union Catalog* (NUC), which is also available in T1211, is another source of information on translations of books. The NUC contains catalog entries of books and some other items processed by the Library of Congress and other major U.S. libraries. NUC entries, like the OCLC entries, mention the source title. Since neither OCLC nor the NUC is specifically designed as a source of information on translations, access is not as direct as might be desired. But the scope of these two sources is much more extensive than any others, and they are thus more likely to have information on translations of books than other sources.

In addition to OCLC and the NUC, translations of books are often included in the sources that concentrate on journal articles.

#### Translations of Newspaper Articles

Newspaper articles are also sometimes translated. FBIS publishes the *FBIS Daily Report*, which includes translations from foreign news-

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papers and radio broadcasts. Some *Daily Report* translations -- those three pages or longer -- are entered into CTS. The print in the *Daily Report* is so small that the five-page limit usually imposed on CTS entries is waived. The *Daily Reports* for the USSR and the PRC are indexed quarterly in publications by NewsBank, Inc.: *Index to Daily Report: Soviet Union* and *Index to Daily Report: People's Republic of China*. These volumes are available in the Reference section of the Main Library. To search for possible translations in the *Daily Reports* for other areas, about the only method is to limit the search by area and date, and then scan tables of contents in appropriate issues.

In-House Translation EffortsMachine Translation

One method of translation that received considerable publicity in the 1950s and 1960s

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is machine translation. Machine translation is actually having a computer prepare a translation. There was to have been no difference in quality or style between a translation done by a machine and one done by a person. Georgetown University was very active in the field for some time. Progress wasn't as easy and rapid as had been anticipated, however, and in 1966 the Automatic Language Processing Advisory Committee published a report recommending that research along machine-translation lines be cut back. This report sharply curtailed federal funding. There is still, however, research being done both here and abroad, and there are several machine-translation systems that claim to be operational. One is the METEO project in Canada, which developed a system that translates weather reports from English into French. CULT (Chinese University Language Translator) in Hong Kong translates two periodicals into English. And a system was developed by a U.S. company for FTD and was adapted for use by NASA during the Apollo-Soyuz Test Project. These systems differ a great deal in their approach and in the amount of pre-editing and postediting that is necessary, but all are true machine-translation efforts.

At present, NSA has a rather limited machine-translation effort.

As machine translation stands today, we haven't reached the stage where we can feed a "source" (foreign-language) text into a computer and produce a text in the "target" (in our case, English) language which is as good as the human product, not without extensive pre-editing or postediting. But in the science and technology world, current machine translation has a place. Some scientists prefer it to the human product. To begin with, the machine product can be made much more quickly than the human product, and the time factor is very important in certain fields. Also, although machine translation is more difficult to read because of peculiar word choice and sentence structure, the translation is consistent. If a word is translated wrong, it will always be translated wrong, and the reader can make allowances. A human translator is liable to change his translation for a particular word, thus causing confusion. Of course, machines have difficulty distinguishing the different meanings a word can have in different contexts. It is difficult to program judgment or background experience into a computer.

#### National and International Cooperative Efforts

The realm of translation is indeed confusing and confused. There are too many people doing translations for too many reasons to make index-

ing easy. There have been attempts, however, to organize some of this chaos.

An unofficial agency in the United States is the National Translation Center (NTC), housed at the John Crerar Library in Chicago. It is the national depository for unpublished translations. These translations are produced by industry, government agencies, and universities. Until 1973, the NTC was supported with National Science Foundation funds. NTC produces an index to its holdings, called *Translations Register - Index*. At one time NSA subscribed to this publication, but we no longer receive it. It reported mostly ad-hoc translations that were rather dated and on subjects NSA is not concerned with. The people at this Agency who referred to it didn't find it useful.

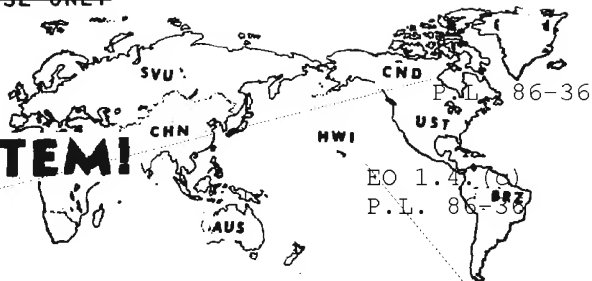
There has also been some effort on an international level. The International Translations Centre (ITC), originally established in 1961 and called the European Translations Centre until recently, has this as one of its aims. The ITC, based in the Netherlands, collects information on translations from national centers and thus can refer requesters to the producer of a translation. ITC also keeps some translations itself, and will reproduce copies of these for a small fee. It produces an announcement of translations that are brought to its attention -- the *World Index of Scientific Translations*. NSA does not subscribe to the *World Index* for the same reasons mentioned with regard to the *Translations Register - Index*. The people who input to the CIRC II system, however, scan a number of publications for science and technology translations to be included in XLAX, and the *World Index* is one of these publications. To introduce some order into the cover-to-cover translation area, ITC also publishes *Translations Journals*, which was mentioned before. At present, ITC is limited to translations from eastern European and Asian languages into western European languages, primarily French, German, and English. ITC also concentrates on the science and technology field, but hopes to expand both field and languages before too long.

Translations are indeed an important part of the collateral scene. They allow access to publications and documents that would otherwise be unusable, and they can therefore be very valuable. Since preparing translations is costly in both money and time, users of translations do not want to duplicate anyone else's efforts. This field is a prime one for cooperation. Of course, cooperation demands reference tools that allow access to what has been done, and, so far, the tools available in the translation realm are far from perfect. Translations are indexed along with other things; there are few sources devoted specifically to them. This can make searching for a particular translation frustrating. But the resources saved when a translation is found and thus not retranslated make the effort worthwhile.

~~CONFIDENTIAL~~~~HANDLE VIA COMINT CHANNELS ONLY~~

# YE GADS! ANOTHER COUNTRY TRIGRAPH SYSTEM!

**T1221**



**W**hile working in the PLATFORM Network Information Center, we became aware of a need for a tool which would enable PLATFORM users to find out which files on the network might contain the information they sought. We identified three elements that such a tool should contain, based on the format "Someone/something from somewhere did something in some way to someone/something from somewhere at some place at some time":

Geographic  
Subject/topic  
Action/event

For example, "On 15 April 1978 the United States agreed to supply F-16 aircraft to Israel":

Geographic: U.S., Israel  
Subject/topic: Aircraft  
Action/event: Sales or supplying

Before being assigned to my current job, I had little experience with collateral or product, so I thought that all of NSA used the Country, Area, and Organization Digraphs in USSID 315. But as we began to pull NSA information together, we found that different NSA elements use a variety of geographic codes. Moreover, as we began to extend our search to find out what information was available elsewhere in the Intelligence Community,

At first we thought that it would be very easy to identify the geographic element -- isn't a country a country? The Content Control Code (CCC) trigraph seemed to be better than the Topic and Area Guide (TAG) digraph, as it added the information on the continental location of the country. As we considered how countries might be referenced, we also came up with the following classifications:

<u>Aspect</u>	<u>Example</u>
Physical	Middle East, Eastern Europe, etc.
Religious	Islamic, Hindu, etc.
Political	Communist, nonaligned, etc.
Economic	European Economic Community, Council for Mutual Economic Assistance, etc.
Military	NATO, Warsaw Pact, etc.

For many months I had been "thinking about" writing for CRYPTOLOG readers an article on the difficulties that the multiplicity of geographic and topical codes was causing the PLATFORM Network Information Center, but reading the words about **new** "system" made me grab for my pen. I realize that NSA's individualism can be a great thing, as one person's exasperated statement that something is "impossible" becomes a challenge to another person, who then goes out and *does* the impossible. But that individualism can be harmful when it leads to a multiplicity of systems, some "official," some "semiofficial," and some "informal." One fine day we will have a computer network and will be able to use other people's files. As we input our machine queries for "China," how will we do it? By using CCH? Or CH only? Or CC or PRC? Or all of them? Or "none of the above," but something else that is being invented as I write these words?

Frankly, any digraph or trigraph is all right for me, as long as it gives me the highest probability of finding the information I seek. Friends tell me it took the CONUS Group two years to agree on a standardized date form (out of an astronomic number of possibilities, such as 80731, 31JL78, 310778, 07318, etc.), so I should not be very optimistic about agreement on standardization of machinable codings to represent countries.

Does this have to be true? I hope not. Otherwise we are creating an intelligence Tower of Babel.

General Allen is alleged to have committed NSA/CSS to FIPS-10 codes within 5 years. I understand this has been retracted. Isn't there someone (or some group of people) who can start solving this problem now, before it reaches the "impossible" state? I think the "smarts" exist here to do it.

## IS A TRANSLATOR A PROFESSIONAL?

G53

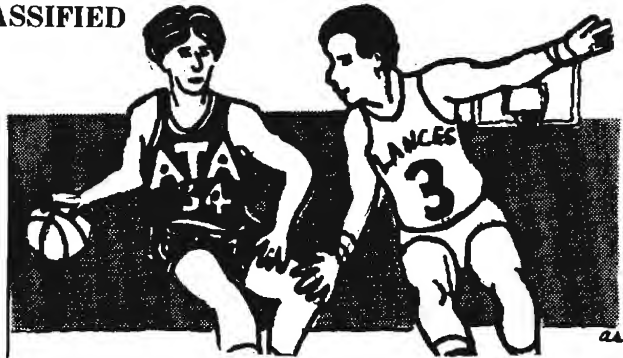
**I**s a translator merely someone whose father or mother was born in the "old country"? Can a graduate of, say, a six-month intensive course in a language gain enough proficiency in the mechanics of that language to take upon himself the title of "professional"? Or is a university-trained linguist, for considerations of depth and duration of study, the only claimant to that title?

These and other associated questions were considered in the open forum "Definition of Translation As a Profession," at the convention of the American Translators Association (ATA). The participants were of a widely varied "professional" background:

- free-lance translators, clearly the dominant group in number, who work with texts running the gamut from children's stories to the applied sciences;
- "in-house" technical translators from U.S. and foreign industry, the most heavily represented being engineering firms and oil companies;
- a French/Italian translator from the World Bank;
- university professors and researchers, primarily involved with Russian, German, and the principal Romance languages;
- foreign-language dictionary and glossary publishers; and
- one Romanian intern from NSA.

Revelation: The National Security Agency is *not* the real world! We at NSA who are styled "linguists" (another title suggested for us has been "languagers") know our place. The terms "certified," "level three," "professional linguist" mean something. The role of the NSA linguist is known to everyone here, at least in broad terms, so that no explanations are required. But out in the real, cash-on-the-barrelhead world of free-lance translation, the translator must at times deal with a special problem. His clients in American industry who, with the rapid onset of multinationalism, are only now beginning to rely routinely on translation services on an appreciable scale, are often ignorant of just who or what a translator really is. A common assumption on their part is that, if a person can translate Polish, he must *be* Polish (or at least have done ad-

*Report on an open forum entitled "Definition of Translation As a Profession," which was held at the 1977 annual convention of the American Translators Association, in Pittsburgh, Pennsylvania. The report was presented at NSA Fort Meade in December 1977 as part of a program jointly sponsored by the CLA's Special Interest Group on Translation (SIGTRAN) and the Special Interest Group on Lexicography (SIGLEX).*



vanced study in East Baltimore). Another assumption is that, if the translator understands English and a certain foreign language, he can easily put into that foreign language anything the client can say, no matter how technical. Free-lancers at the open forum gave examples such as the one in which an oilman with a knowledge of what "pump down and wireline" technology is all about, assumed that the translator would have a simple task in "making it say that in Yoruba." The fact that the oilman's African customers might be bemused to find, upon reading the contract in their own language, that American oilmen routinely stuff a "dog" (an actual piece of pump-down hardware in the lexicon of some U.S. companies) into an oil pipeline to open or close a valve is of no concern to the employer: it's the translator's problem. "Well, if it doesn't translate, then just describe it." Unfortunately, all the other companies dealing with the apparatus are also describing it, and everyone is probably doing so in a different way.

### A National Certifying Agency for Translators?

It is clear that some vehicle to present the translator's case, some method to publicize his usefulness, to proselytize a little if need be, and to clarify his role to the consuming public does have its attractions. A monolithic agency (of the American Bar Association type) to set standards, guard ethics, and enfranchise practitioners would seem to be a ready answer. This proposition, in fact, became the core issue of "Definition of Translation as a Profession." Assuming that ATA, which already administers examinations in a number of languages at its conventions and enjoys representative membership in many areas of the field of translation, would be the proper body to manage the "profession" as such, the task then becomes to fix a title on a linguist that lucidly conveys something about competence, prestige, relative standing, etc. This, of course, has many ramifications -- "grandfathering" of a group to confer the title initially; prerequisites; effect of the title on salary; etc. NSA, with its structured certification system, has attacked the professionalization problem in a reasonably coherent way. In the unstructured world of the free-lance translator, however, a clear-cut definition of "professional" is appreciably more elusive. At the ATA forum it was the free-lancer, both in the role of proponent and of opponent, who proved the most vocal on this subject.

"Professional" Like a Basketball Player?

A free-lancer is, in the truest sense, a capitalist, an entrepreneur whose standard of living is directly proportionate to his linguistic competence, marketing aplomb, and, by no means least, his audacity in fee-setting. It is an intensely competitive field in which the individual must make it on his own. Successful translation over many years in scientific and technical fields may serve to enhance a reputation and facilitate the finding of profitable employment. One fundamental error in the translation of a valuable contract, however, can wreck a career. It was not in the least surprising, then, that the veteran free-lancers at the ATA forum, who had survived and prospered over the years without benefit of any sort of badge of professional standing to aid them in the market, reacted the most negatively to the concept of formal "professional" status for translators. Their "professionalism," they felt, is evident from their bank accounts. Just as a "professional" athlete (as distinct from an amateur) is one who derives his principal income from being an athlete, they feel, admittedly simplistically, that a "professional" translator is simply a person who derives his principal income from the act of translating. It must be pointed out that these experienced translators at the ATA forum were by no means playing semantical games with the term "professional." The same considerations that have often been expressed within NSA on the distinction between "technical" and "professional" levels (echoing the blue collar vs. white collar tension of the world at large) underlay their debate.

Reasons Why Novices Want Certification

By contrast, the novices in this same group, for the most part recent university graduates just entering the market, were the most outspoken in their support of an orderly system to identify and certify "professional" translators. Lured by the promises of independence, variety, and remuneration linked directly to skill and diligence, they were more than willing to submit to testing or any other form of objective comparison in order to dull the competitive edge of their more established colleagues. Success in a one-shot showdown of this sort was perceived of as an attractive circumvention of the protracted process of developing a "professional" reputation over many years. Show the certificate and the world will beat a path to your door!

Reasons Why Senior Free-Lancers Don't

The response of the senior free-lancers was simply to attack the entire proposal as presumptuous. The title "professional" itself, as applied in common parlance, is the privilege of, for example, a physician, one who has studied for long years to achieve his universally recognized occupational and social status. His years

of study were the solitary route to his respected position. Such a title seems distinctly inapplicable to one who has acquired his skill through no more than an accident of birth. Doctors are not born, but a linguist may well be.

The veteran free-lancers also felt that the fruits of a formal certification program would simply not be commensurate with the effort required to put it into operation. They were understandably concerned with the inevitable pressure for tailored examinations to evaluate equitably both the translator of fairy tales and the translator of engineering specifications, and all those who fall in between them. They wished to know if professionalization would be based solely on testing. Would recalcitrants who shun participation be in some respect blackballed? Would a professionalization system make any earthly difference if the consumers of translations services are not persuaded to give it any credence, but instead choose to ignore the titles and other paraphernalia and continue to employ translators whom they have come to know and trust over a period of time?

Conclusion Drawn by Forum Participants

The conclusion of the forum was that there could be no conclusion. Beyond a feeling that one who lives by translation must be something like a professional already, the experienced translators participating did not foresee professional certification in the offing. The less experienced desired it earnestly. So far, at least, supply and demand has adequately served to advance the skilled and eliminate the rest. Professional standing at present is rooted in peer esteem, customer retention, and plain economics.

These senior translators, who represent the highest state of their art, needing no external endorsement to aid them and perhaps a little unwilling to risk besmirching a reputation by failing, as some must invariably fail, to qualify in an "objective" testing of the skills that have been their stock in trade for a lifetime, predictably resist. In their free-market environment, there is no practical way to impose certification. The novices, on the other hand, lack the clout necessary to force the issue. Many of them, experience has shown, will not be in the field for very long in any case, as attrition takes its toll. This is hardly the basis for a ground swell. Since the free-lancers are such a large group among all translators, both numerically and in influence, any certification system undertaken which ignores their specific needs is doomed to failure at the outset. Neither could it hope to secure the support of the consuming nontranslator public whose acceptance or rejection of the translator as a professional must, in the end, be determinative.

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# THE BUCKY BALANCE

P.L. 86-36

**T411**



he Bucky Balance -- no, it isn't a balancing act, or an exercise program, or a new dance. It is, however, a little different approach to the subject of productivity.

With the coming of Metzger and his design concepts, we are beginning to see the benefits of spending more time defining the project before we implement the system. This approach is very applicable to large- to medium-size projects with several people involved. This team approach has not, however, been applied to the smaller projects that have traditionally been assigned to one individual.

## What Can Be Done for the Average Worker in the Small Project or Task Area?

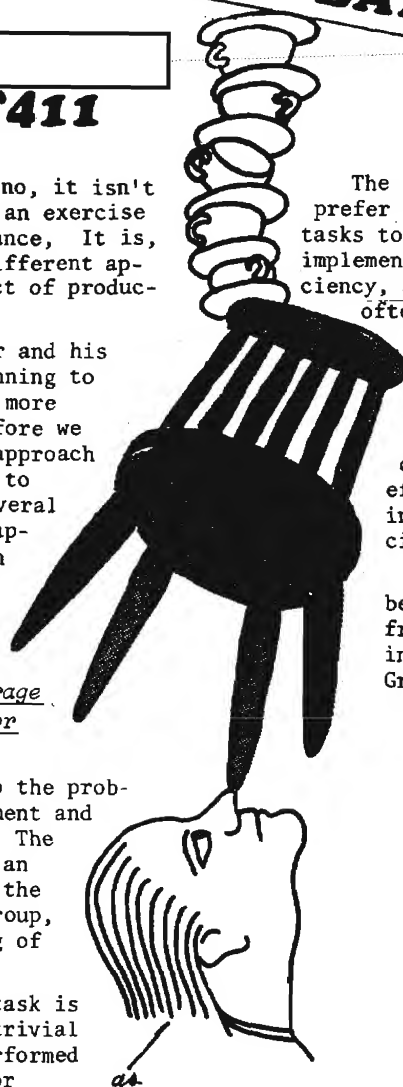
This paper is addressed to the problem of small projects management and help for the average worker. The success of small projects in an organization is important to the overall achievement of the group, in addition to the well-being of each worker.

**Definition:** A project or task is a unit of nontrivial work to be performed by one, two, or more workers.

I suggest that within organizations there exist two distinct subgroups of workers.

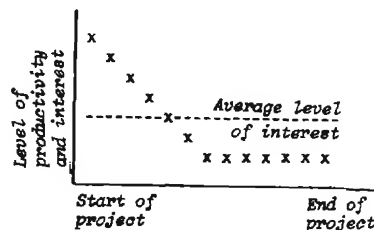
Individuals in the first group are known as Project Starters. The Project Starter prefers to be given general guidelines for a project, then left alone to do his own design effort. The Project Starter's interest level is highest at the beginning of the project and declines as the major project decisions have been made. Graph 1 shows the interest level plotted against time spent. It is also felt that a worker's productivity is directly related to his interest in what he is doing. His interest centers around planning and designing how the task should be done. He is always trying new and sometimes farfetched ideas.

*This paper was presented at the 1977 Spring Conference of NSA's Computer and Information Sciences Institute (CISI), where its author won Third Place in the Conference Awards.*

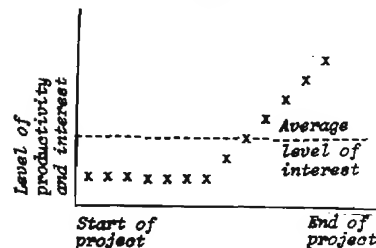


The second group, the Project Finishers, prefer to be given specific, well-defined tasks to perform. Their interests involve implementation techniques, operation, efficiency, and testing. The Project Finisher often has problems getting started but, with a little help, usually makes a strong finish. Graph 2 shows the interest and productivity of a Project Finisher plotted against the degree of completion of a project. Of course, there are some workers who are efficient at both starting and finishing, and probably a few who are efficient at neither.

Traditionally, the entire project has been assigned to an individual to do from start to finish. His productivity/interest level will resemble either Graph 1 or Graph 2.



Graph 1



Graph 2

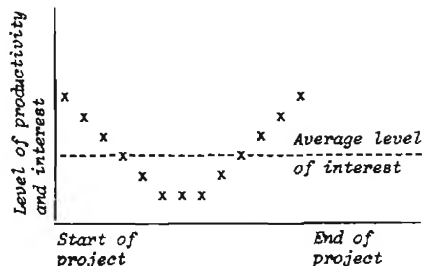
**Theorem:** The average level of productivity on a given project can be improved by pairing a Project Starter with a Project Finisher, using a division of labor. This pairing is called complementary couplet.

Graph 3 shows the productivity/interest levels of a complementary couplet plotted against the degree of completion of a project.

In order for the complementary couplet theory to be effective, the manager must be able to identify the Project Starters and Project Finishers in his group. There must also be well-

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defined procedures for transferring a project from a Starter to a Finisher.



Graph 3

#### How to Distinguish a Project Starter from a Project Finisher

Helpful hint: The best way to spot a Project Starter or a Project Finisher is to observe the person's working habits closely.

Theorem: The Project Starter is interrupt-driven.

The Project Starter will begin work on Task 1. When given Task 2 to do, he immediately drops Task 1 by putting it in his hold tray or dropping it in his bottom drawer. He then starts Task 2. If he is interrupted with another job, Task 3, he pushes Task 2 onto his hold stack and starts Task 3. If uninterrupted for a sufficient length of time, he may actually complete Task 3. He will then pop-up Task 2 from the stack and resume work on it. If interrupted with Task 4, back to the stack for Task 2, and so on. Every task that he is assigned gets a higher priority than the one before. He operates on a last-in-first-out basis. Most Project Starters have at least one uncompleted project stashed in the bottom drawer that has been sitting there since they came into the office.

Theorem: The Project Finisher functions as a first-in-first-out queue.

The Project Finisher prefers to work on a one-task-at-a-time basis. The Project Finisher will not start Task 2 until Task 1 is completed. His hold tray is empty but tasks to be done are piling up in his in-basket. He will get to each task as soon as the previous task is complete. Every task that enters his queue comes in at the lowest priority. He takes his task in first-in-first-out order.

#### General Characteristics

You would be more likely to find a Project Starter organizing meetings or planning sessions. He is usually outspoken and advocates change.

Project Finishers are much better at documentation. They probably have authored many office bulletins describing how to use their

completed projects. In programming projects, their software has been tested better and is more bug-free than comparable software written by Project Starters. Project Finishers are more concerned with details and prefer the status-quo methods to new techniques.

#### How to Get a Project from a Project Starter to a Project Finisher

One of the most important aspects of the Bucky Balance is an orderly, well-defined procedure for transference of a project from a Starter to a Finisher.

Definition: A project is in a suspend state when it is not being worked on actively.

The status of a project should always be recorded and filed in the Project Status Record before the project is suspended. For example, the Project Status Record for a programming project should minimally include current listings of:

- . programs,
- . run streams,
- . reference documents,
- . problem specifications,
- . narrative documentation, and
- . data-flow analysis.

It is very important that the Project Starter and the Project Finisher come to an agreement on project conventions when work begins. Project conventions on a programming project might include what language to program in, whether to use structured design and programming techniques, or which system to use for the project. Some of these decisions may be dictated by the specification of the project itself. However, when convention decisions are made that will affect the way the entire project has to be done, then this decision should be a joint one between the Starter and the Finisher.

The Project Status Record is the link between the Starter and the Finisher. For a programming project, the specification should include the requirements, a general concepts paper, and a detailed design, as well as general test procedures. Often the testing ideas are conceived during the design stage but, unfortunately, are not documented. Thus by the time they are needed, they have been forgotten and must be thought out again. Including ideas on testing in the Project Status Record will benefit the Finisher when he implements the testing package.

Having current listings of programs and run streams are common sense as well as good procedure. It's difficult enough to take over a program from another worker without the additional problem of searching for the latest updates or patches.

The reference documents are important also. Sometimes the Finisher needs more information than is provided in the Problem Specification. The reference documents or manuals provide the basis of general information concerning the project.



The narrative documentation should reflect the Starter's design philosophy, as well as specific technical information. This has been a brief description of the Project Status Record for a programming project. The Project Status Record would be somewhat different for a hardware acquisition project or an educational course set-up project.

Theorem: A suspended project can efficiently be restarted by a Project Starter or a Project Finisher if the Project Status Record is well-defined.

Note: A project need not be suspended before it can be transferred. It is necessary, however, for the Project Status record to be current.

Use of the Project Status Record can also help the Project Starter when he picks up the job that has been in his stack for a long time.

Here is a short quiz. The answer choices are neither right nor wrong, but do illustrate the difference in attitude between the Project Starter and the Project Finisher. The "a" answers reflect the Finisher's point of view, while the "b" responses reflect the Starter's preferences.

#### QUIZ

1. You are given a new project to do. You would rather:
  - a [] Do it the same way you've always done your projects. Even though it's tedious, you know it works. Punching your program on cards that you can keep with you is safer than using a scope.
  - b [] Try the new structured programming in the nude approach you've been reading about that might save time or be a better way. At least in the summer it would be cooler.
2. Given a new task to do:
  - a [] You'd rather do anything than make an important decision. If you didn't make the decision, then you can't be blamed if it doesn't work.
  - b [] You want to make all the decisions, from what language to use to what color cards to punch your program on.
3. You receive a phone call from a grumbling user, stating that option Q on your dandy list program isn't working. What do you do?
  - a [] You tell him to submit it in writing with two box tops from his favorite cereal and you will get around to looking at it when you are finished doing the three other tasks you have been assigned. That should be 3 weeks from next Tuesday.

- b [] You tell him to bring the dump down immediately. So what if the project you are currently working on has a deadline of yesterday? This new problem sounds more interesting.

#### How to Motivate Project Starters and Project Finishers

Theorem: Project Starters are challenge-motivated.

The Project Starter is excited by the new and unknown aspects of the project. He is determined to conquer the problem and all obstacles in his path. The challenge lies in determining just how all the pieces will work together, rather than in seeing it actually perform as designed. The Project Starter enjoys learning new things and does best on projects that offer this kind of challenge.

Theorem: Project Finishers are satisfaction-motivated.

The Project Finisher takes pride in a job well done. He enjoys working on the details. He needs to be appreciated for his efforts and gets satisfaction from seeing all the pieces perform optimally.

The Project Finisher is procedure-oriented and would prefer to use established methods and already acquired skills to perform his tasks.

#### How to Manage Project Starters and Project Finishers

A manager has certain responsibilities for the well-being of all his workers. He should try to uphold the worker's "Bill of Rights," which include the following:

visibility - Project Starters and Project Finishers both have the right to visibility to their immediate supervisor as well as higher-level management on at least one project they are assigned to. The Project Status Record can help bring achievements and progress to the attention of management.

worthwhile assignments - Project Starters and Project Finishers have the right to feel that the work they are doing is productive and useful and, in general, worth doing.

praise - Project Starters and Project Finishers have the right to be praised and noticed for jobs well done.

constructive criticism - Project Starters and Project Finishers have the right to be constructively criticized and advised about their performance by an informed manager.

project review - Project Starters and Project Finishers both have the right for periodic reviews of on-going projects to reevaluate priorities and progress. Review of the Project Status Record can be an aid to the worker as well as to the manager.

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In addition to supporting the above "Rights," the manager must also be a sounding board to his Starters and a guiding light to his Finishers.

The manager should listen to the many ideas of the Project Starter -- helping him to select the better ones and to reject the unworkable ones. He should guide the Project Finishers and help point them in the right direction, making sure that each Project Finisher knows exactly what is expected of him and all that the task entails.

Managers should realize the difference in Project Starters and Project Finishers and use this difference to the good advantage of the project. Job performance evaluations should also take into consideration whether a Starter or

Finisher is being evaluated, and criteria for evaluation should be developed for each.

The success of small projects in an office contributes significantly to the overall office morale. The productivity level of the workers can be increased by pairing a Project Starter and a Project Finisher on the same project. I hope that some trial projects will be monitored using the Bucky Balance approach so that the validity of my theorems can be proven.

Being a Project Starter myself, it has been very difficult to finish this paper. So in conclusion. . .

(U)

## TELL ME I'M JUST A SINOBIOLIO- PHOBE!

R51

P.L. 86-36



**A** afraid of a book? Who could be afraid of a book? Why, even the dictionary definition of "bibliophobia," which one might expect to be "fear of books," turns out to be "strong dislike of books." No one is frightened by a book!

Except me! I've just been looking through a Chinese mathematics textbook that was published in Peking in 1976. It's a two-volume paperback edition (about 300 pages per volume), the translated title of which is *Fundamentals of Engineering Mathematics*. The book was written by an unnamed group of authors. In the preface they cite various works by what would appear at first glance to be two people with the same last name (both names are spelled with the same three Chinese characters). But the first one soon proves to be Karl Marx, and the other one, the person whom the authors have chosen as their pedagogical model, would appear to be Robert W. Marks.

The NSA Main Library has a copy of Robert W. Marks' book *The New Mathematics Dictionary and Handbook* (call number QA5: M34). To quote from the Preface to the Marks book,

"The keynote of this text is clarity -- without sacrifice of authority and definitional precision. All definitions are simple and stand as independent units of explanation. They are meaningful to every reader of average background whether or not he has had prior experience with any form of mathematics beyond the elementary level."

The Chinese text goes beyond Marks in several directions. At the low end, it begins at an ultra-elementary level. Its first theorem (p. 7) asserts that the sum of the interior angles of a triangle equal  $180^\circ$ . Only a few pages later it gives the basic arithmetic properties, i.e., commutativity, transitivity,

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and distributivity. Two pages later it defines "coefficients" (by underlining the two relevant Chinese characters). Throughout the two volumes a goodly portion of each page is taken by illustrations (charts, graphs, drawings) and detailed implementation of calculations for the numerous examples. As promised in the Preface, each of the fourteen chapters begins with an outline of its contents and ends with a brief concluding statement.

This latter promise, ending the second of the Preface's five paragraphs, is preceded by an offhand remark that the arrangement of the text is designed for the convenience, and ease of comprehension, of the worker-peasant-soldier student in his *self-study* (i.e., teacherless) attack on the material. It was at this point that I began to feel frightened. If any significant number of those worker-peasant-soldier students self-studied their way through that 1976 textbook, the present technological advantage of the United States (and of the USSR) might not remain so overwhelming all through the foreseeable future.

To give just the flavor of the textbook, let me list the titles of the fourteen chapters and the two annexes. I mention in passing that each chapter contains several "problem-exercise sections," the "solution-answers" to which are printed at the end of the volume in which the chapter appears. Also, each chapter ends with its labeled Postscript. Here I furnish just the titles of the fourteen chapters and the two annexes (with their first-page numbers in the Chinese text):

Volume I

Chapter	Page
1 Basic Information on Forms and Numbers	1
2 First-Degree Equations; Direct and Inverse Proportion	28
3 Trigonometric Ratio (Side, Angle) Calculations	87
4 Algebraic Operations	134
5 Curves and Quadratic Equations	188
6 Functions	237
7 Derivatives and Definite Integrals	263
Answers	313

Volume II

Chapter	Page
8 Exponential and Logarithm Functions	1
9 Trigonometric Functions	31
10 Differential Calculus	81
11 Integral Calculus	143
12 Differential Equations	194
13 Series	229

14 Algorithmic Language Introduction	281
Annex	
I Complex Numbers	335
II Matrices and Simultaneous Linear Equations	354
Answers	402

A few footnotes to the foregoing. The first ten pages of Chapter 14 only introduce the subject of an algorithmic language (avowedly derived from ALGOL-60) after broaching, in some detail, the question of electronic digital computers, very major attention being given to the [IBM] 709 computer (vintage 1957) and the domestic mainland-Chinese TQ-16 (48-bit word, 32K memory, what looks like punched paper tape for input-output operations). About half the problems for Chapter 14 (answered on pp. 418-421) are answered by ALGOL-like responses. Moreover, the last subsection of Annex II is devoted to a listing, with adequate exegesis, of a computer procedure for implementation of the Seidel simple iterative method of solving simultaneous linear equations.

That second annex begins with determinants and ends with simultaneous linear equations. In between, of course, are matrices (pp. 362-376). The compilers of the textbook, in introducing matrices, hark back in Chinese history to the first-century "Nine Chapters of Arithmetic," where, according to the twentieth-century Chinese historian Ch'ien Pao-ts'ung, matrix methods were first used in solving simultaneous linear equations. In his book, the translated title of which is *The History of Mathematics in China* (call number AQ 27.C5: CY3), any cryptologic mathematician, however lacking in Chinese literacy, can follow, on pp. 52-54, the solution process with the attendant abacus-like notation.

Please let me know if I shouldn't feel frightened.

(U)

## ***Solution to NSA-croistic No. 15***

By A.J.S. (CRYPTOLOG, June 1978)

Sydney Fairbanks, "Editorial Comment," *NSA Technical Journal*, October 1957. Reprinted in *Collected Editorials of Sydney Fairbanks [1956-1959]*, *NSA Technical Journal Special Issue*, December 1966.

"If we were one having authority, saying to one man Spell, and he spelleth, and to another Punctuate, and he punctuateth, we would issue a decree that no sentence could start with 'however' or 'therefore', -- and then sit back and listen in grim glee while the typewriters stopped and silence settled in the corridors."

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**NSA-crostic No. 16**by guest NSA-crostician  
David H. Williams, Pl6

The quotation on the next page was taken from a published work of an NSA-er. The first letters of the WORDS spell out the author's name and the title of the work.

DEFINITIONSWORDS

- A. ---- Capp  
218 6 143 44
- B. Band leader's first name;  
comedian's last name  
88 102 63 27 96
- C. Followed by Word D, why the keeper,  
carrying a sack of sea birds he in-  
tended to feed the zoo's dolphins as  
an aphrodisiac, was arrested by a  
federal agent as he stepped over Tar-  
zan and Jane (the zoo's mascots, com-  
pletely tame, sedate jungle cats),  
who were sleeping on the steps  
(9 wds)  
100 176 189 180 89 127 144 209 109 162 155 39 80 133  
26 76 10 205 110 198 152 193 68 29 14 136 22  
46 113 167 60 3 34 214 13 220 37 95 18 52
- D. See Word C (6 wds)  
141 202 41 134 101 90 75 170 165 181 221 86 11 117  
74 4 184 148 91 16 45 38 128 164 50 168 158  
55 30 70 212 28 197
- E. The novel Steinbeck never wrote  
about the venetian blind industry  
(4 wds)  
196 153 150 130 138 83 47 105 61 199 187 163 17 7  
217
- F. NSA career field (2 wds)  
161 142 9 186 25 5 216 54 129 108 173 194 135 19  
151
- G. Fertile, green; drunkard  
82 126 160 206
- H. Professional tennis star (full  
name)  
211 104 36 33 191 92 40 157 12 67 213 20 120 87  
223 172 185 200 114 53 77
- I. Tossed  
156 147 204 207 8
- J. French acknowledgement of a hit  
183 73 121 43 107 112
- K. Displayed clearly  
132 64 154 21 58 32 145
- L. Amend; improve  
103 79 35 166 93 1
- M. Regis -----  
97 15 51 115 94 131
- N. "Are you ---?" (antepunchline)  
98 72 215
- O. Thirst quencher in Boston:  
"a boddle-a ----"  
123 116 171 85 140

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P. "Tales of -----"

124 57 119 177 31 192 149 222

Q. Produce a picture or design by  
chemical action

59 106 146 111

R. Palindromic body part

182 159 203

S. "The ----- Dozen"

175 62 56 208 2

T. Poem by Kipling

65 137

U. Delicious; attractive

84 125 99 118 23 195 66 179 139

V. External

71 81 169 24 48

W. "Retain our men"

78 201 210 174 219 178 122 190 69 188 49 42

1 L	2 S		3 C	4 D	5 F	6 A	7 E		8 I	9 F	10 C		11 D	12 H	13 C
	14 C	15 M		16 D	17 E	18 C	19 F	20 H	21 K		22 C	23 U	24 V		25 F
26 C	27 B	28 D		29 C	30 D	31 D	32 K	33 H		34 C	35 L		36 H	37 C	38 D
	39 C	40 H	41 D	42 W	43 J	44 A		45 D	46 C		47 E	48 V	49 W	50 D	51 M
52 C	53 H		54 F		55 D	56 S	57 P	58 K	59 Q	60 C	61 E		62 S	63 B	
64 K	65 T	66 U	67 H	68 C	69 W	70 D	71 V	72 N		73 J	74 D		75 D	76 C	77 H
	78 W	79 L	80 C	81 V	82 G	83 E	84 U	85 O	86 D	87 H		88 B	89 C	90 D	
91 D	92 H	93 L	94 M	95 C	96 B		97 M	98 N		99 U	100 C	101 D	102 B	103 L	104 H
105 E		106 Q	107 J	108 F	109 C		110 C	111 Q	112 J		113 C	114 H	115 M	116 D	117 D
118 U		119 P	120 H	121 J	122 W		123 O	124 P	125 U	126 G	127 C	128 D	129 F	130 E	
131 M	132 K	133 C	134 D	135 F		136 C	137 T		138 E	139 U	140 O	141 D	142 F	143 A	144 C
145 K		146 Q	147 I	148 D	149 P	150 E	151 F	152 C		153 E	154 K	155 C	156 I	157 H	158 D
159 R		160 G	161 F	162 C	163 E	164 D		165 D	166 L		167 C	168 D	169 V		170 D
171 O	172 H	173 F	174 W	175 S	176 C		177 P	178 W	179 U	180 C	181 D	182 R		183 J	184 D
185 H	186 F	187 E	188 W	189 C		190 W	191 H	192 P	193 C	194 F	195 U	196 E	197 D		198 C
199 E	200 H	201 W	202 D	203 R	204 I		205 C	206 G	207 I		208 S	209 C	210 W	211 H	212 D
	213 H	214 C	215 N		216 F	217 E	218 A	219 W	220 C	221 D	222 P	223 H			D.H.W

(Solution next month)

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# News of the Communications Analysis Association

Our able CAA correspondent, [redacted] (P14), was wending his way through "the field" when this month's CRYPTOLOG was put to bed. Wayne is, among other things, spreading copies of CRYPTOLOG and information on the CAA among our field colleagues, a la Johnny Appleseed, in the hope that readership and interest in the activities of the CAA will flourish. He has reluctantly consented to yield his pen this month to Dave Gaddy.

## Branching Out

One of our objectives for this year is to bring more military analysts into CAA, which, in turn, leads to finding ways of making CAA more useful to them. The Agency's senior enlisted man [redacted] met with the Board of Governors in March, and, at the request of his successor, [redacted], the CAA president met with the Senior Enlisted Advisory Council in May to explain the purpose and goals of the Association.

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## The Compleat Analyst

Over the past year the CAA leadership has been exploring ways in which the Association might assist in developing a new breed, tentatively known as a "communications analyst." The germ of the idea lay in the perception that the challenge facing us today and in the foreseeable future is not one for the "conventional" disciplines of past decades, but one in which traditional distinctions have become blurred. A more versatile, better-trained analyst is required. The same sort of motivation has led to a reconsideration of NSA's COSC structure and to a reexamination of workforce development on the part of DDM. The main question is, what, if anything, CAA can usefully do through -- and for -- its membership.

Some of us (including the Director, it would seem) believe that CAA does have a role. One of our goals is professional growth. Our span encompasses the broad field of "communications analysis," both SIGINT and COMSEC. Our membership comprises some first-class craftsmen (craftspersons?). We can't avoid being concerned. But what can we do?

One suggestion centers on professionalization: for example, offering voluntary assistance on the part of CAA members to aspirants in the related career fields. Is "the compleat analyst" a multiprofessionalized analyst -- necessarily? Is full professionalization of the analytical workforce desirable? Is "the compleat analyst" a stage beyond even multi-ticket professionalization? Is it a "postgraduate" accomplishment? "What's in it for me" in terms of promotion or advancement? Is it a personal thing, or is it a recognized "plus" for the record?

That one suggestion illustrates the complexity of the problem (or is it the fuzziness of the objective?).

Our former president, [redacted] continues to be interested in this subject, as are [redacted] Dan Buckley (M). They, or, for that matter, the Board members individually or as a group, would welcome your views on the subject.

In a related vein, we have received several proposals for field chapters, perhaps at the SCA headquarters, regional offices and installations. We will be considering ways in which we can support field activities and welcome additional views on the subject.

## CAA Programs

The Special Interest Group on Cryptologic History spent a delightful time with P. William (Bill) Filby, reminiscing on "Bletchley in the Steam Days." A highlight for the year was the Director's May address in the Auditorium, "Is There a Future for the CAA?" (The answer associated the goals of the CAA with the future needs of the U.S. SIGINT System as seen by its Chief.) Our June speaker is Dr. Clint Brooks of W, with the mind-stretching subject "Interstellar SIGINT."

## Meet the Treasurer. . . Please!

[redacted] our treasurer, also spends a considerable amount of time as a Cryptologic Staff Officer on the B Group Operations Staff. Tim earned his BA in English (1960) and his MA in International Relations (1970) at Georgetown University.

Tim started his cryptologic career with the Communications Intelligence Officer Course at Goodfellow AFB in 1962, followed by the CY-100 course at NSA. He served a tour with the Air Force in Germany, followed by a year in Saigon and a year in Washington on the Air Staff. He started his career at NSA in 1968, and has been with B Group since then, except for one year with the Army at Vint Hill Farms Station. He is certified as a Traffic Analyst, Research Analyst, and Collection Management Officer.

P.S. If you haven't joined CAA, Tim will also gladly exchange your worn and tattered dollar bill for a nice, new membership card.

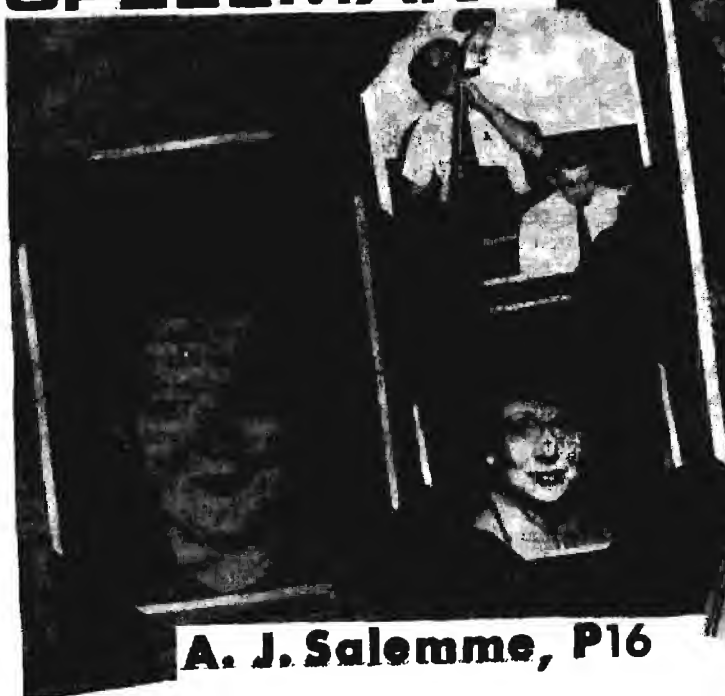
## Board of Governors, CAA:

President	David Gaddy	3247
President-elect	Frank Porrino	5879
Secretary	[redacted]	8025
Treasurer	[redacted]	3791
Board members	[redacted]	4935
		5991
		3575
		3369

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# I REMEMBER SPELLMAN



**A. J. Salemme, P16**



**Y**es, I remember SPELLMAN! Not Congresswoman Gladys Noon Spellman, of Maryland's 5th District -- her I've never met. Nor do I mean the late William Cardinal Spellman -- him I never met either, although I often wished I had, if only to ask him if he indeed began wearing a large S under his vestments when he learned that Japanese press reports of his visits to U.S. troops during the Korean War spelled his name, in Romanized form, "Superman." No, what I mean is *Project SPELLMAN*! It was the project that Jack Gurin referred to in last month's CRYPTOLOG when he said, "I had a file of papers, the only one of its kind, relating to an experiment which had been conducted in an attempt to improve our processing techniques." Jack went on to say that, despite his best efforts to preserve all the information pertaining to that experiment, it had all been thrown away. Well, I was one of the people involved in one phase of that experiment, and I still have strong impressions of it, more than 17 years later. I feel that the best way to reconstitute the general impression about the project (if not the specific details, such as how many hours Student A spent on such and such a day copying Tape 1) is to ask the various participants to tell their version of the story. It could be a kind of "NSA Rashomon," like the movie, based on a traditional Japanese folk tale, in which the same event is described separately, and oh

how differently, by each participant -- the husband, the wife, the bandit chief, the casual passerby, etc.

So, professor, a little samisen music, if you please. . .

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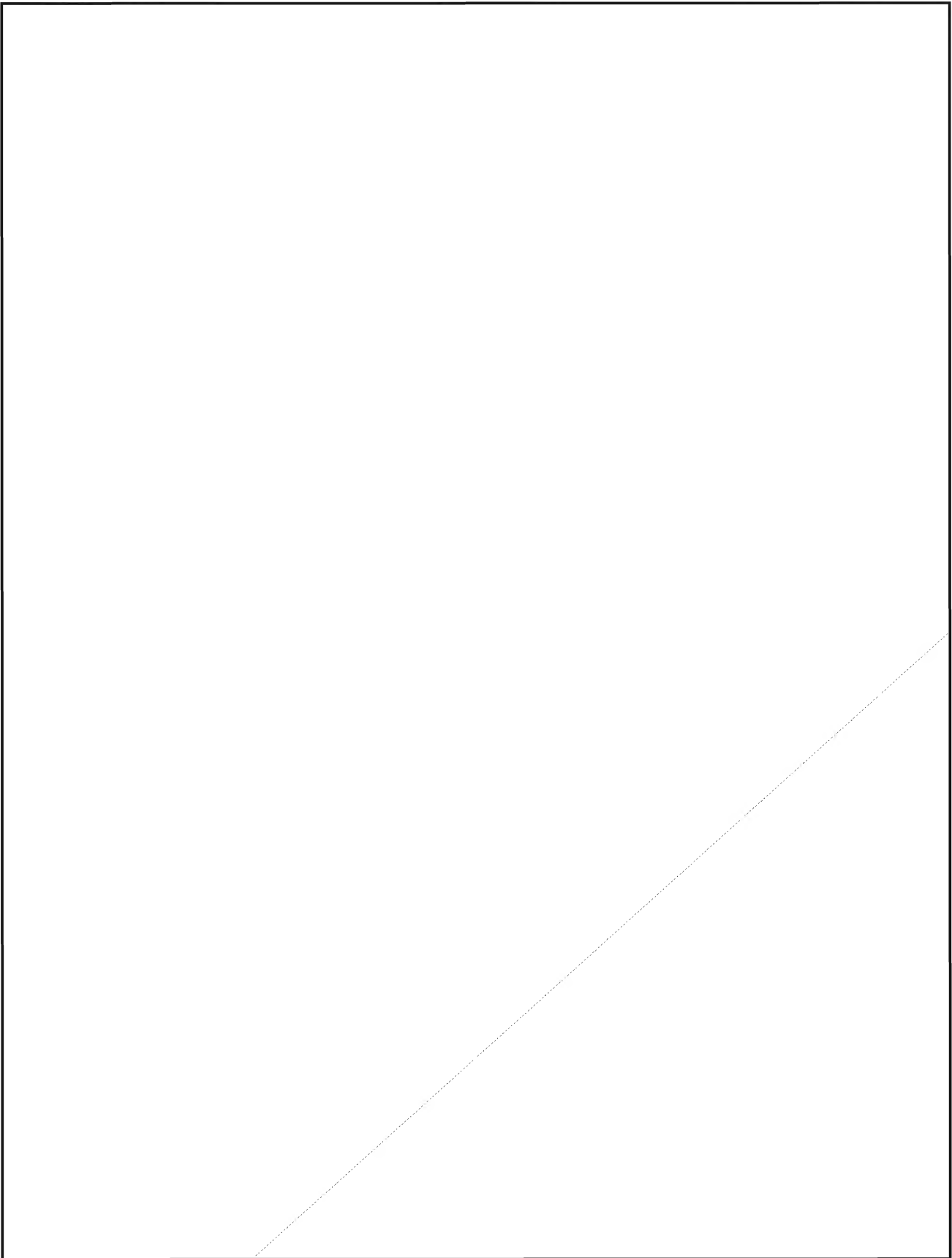
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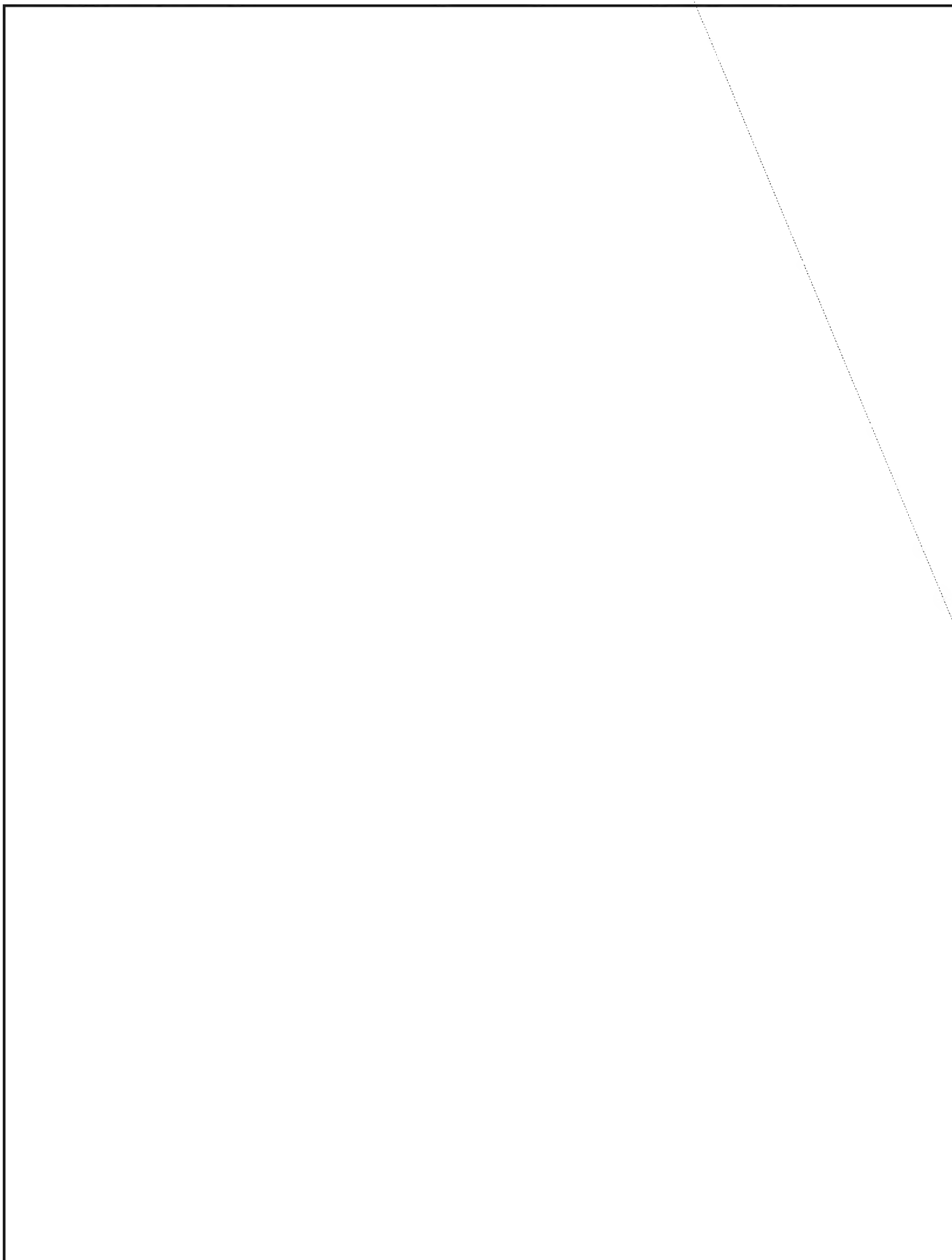
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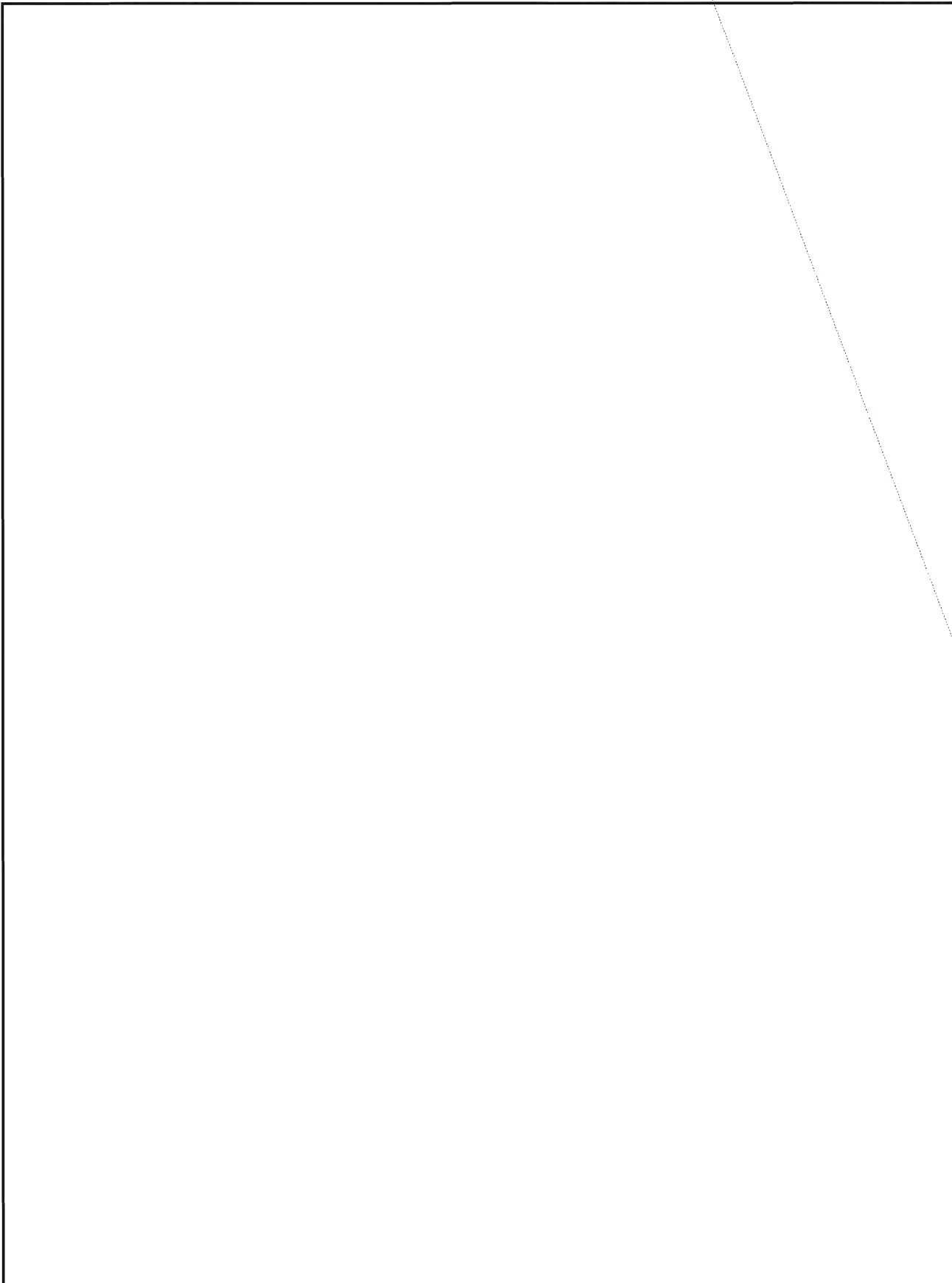
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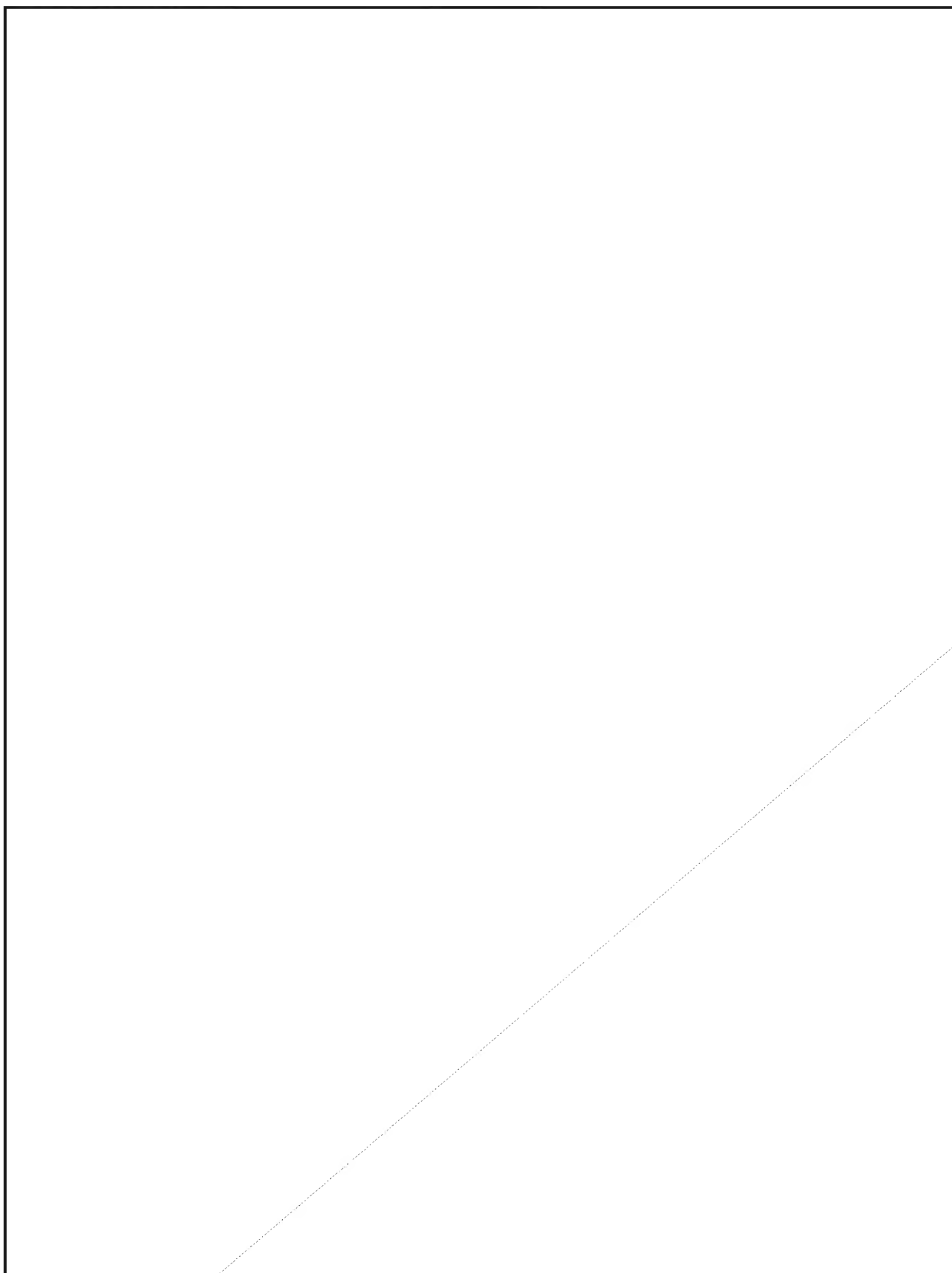
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**THE PUBLISHER WELCOMES:****NEW BOARD MEMBERS**

With this issue we make a few changes in the makeup of the Board of Editors. Reed Dawson, Mathematics Editor, and [redacted] Traffic Analysis Editor, have completed their tour on the Board. We extend our thanks to them for a job well done. We also welcome three new members to the Board: [redacted] R51, Mathematics Editor; [redacted] H115, Traffic Analysis Editor; and [redacted] G931, editor of a new CRYPTOLOG department -- Cryptolinguistics. Ed, Don, and Amelia have promised to carry on the CRYPTOLOG tradition of asking each and every colleague to "write it up for CRYPTOLOG."

I would like to use this opportunity to remind our readers that CRYPTOLOG is intended as a vehicle for the informal, timely exchange of views on the specialist-to-specialist, analyst-to-analyst level. So, if you have anything that you want to say, don't be shy! Write it up for CRYPTOLOG! If you need any kind of help in putting your ideas on paper, ask any of the Board members. Their job is to make it easier for you to present your views to your coworkers.



William Lutwiniak,  
Publisher

(U)

**THE EDITOR PROMISES:****NO MORE MISPELLINGS!**

As the person who would have won the city-wide Boston Spelling Bee in 1937 if it hadn't been for the word "atrophied" (I've been waiting 41 years to use that word so that I could spell it correctly!), your CRYPTOLOG editor/typist/compositor likes to think he's a pretty good speller. Therefore it is always exasperating to hear from an eagle-eyed reader that, despite numerous proof-readings by the e/t/c, the author, and assorted last-minute checkers, a typographical error has snuck into an otherwise perfect issue of CRYPTOLOG. Whenever a new issue comes out, I know that the first phone call will be not to tell me how much the person liked So-and-so's article, but to report a typo! So I have finally decided to propose a deal like the one agreed on by the group of buddies who liked to spend two weeks each year fishing in Maine, but all of whom hated to cook (the joke with the punchline ". . . but good!"). The next person who even mentions the words "typographical error" thereby agrees to do all the proofreading for the next issue of CRYPTOLOG being prepared for press. All right? Okay, then, I defy anyone to find the next misspelling!

Art,

(S - CCO)

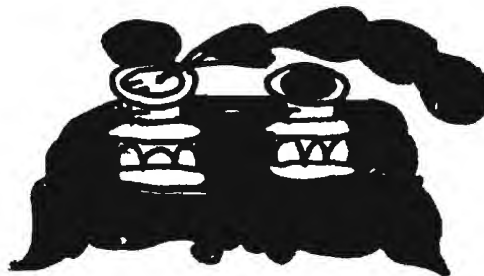
(For your dialing convenience: x5236s)

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~~SECRET SPOKE~~

# Letters to the Editor



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To the Editor, CRYPTOLOG:

1990," by [redacted] I couldn't agree more with Mr. Hunt in his concern that we devise ways to improve our efficiency in handling huge increases provided by increased collection facilities. We in R5 are not only concerned -- in R54 it is seen as their task to come up with sound, workable ideas on how to get on top of the problem of huge quantities of intercepted voice.

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But I would like to draw attention to another problem in the area of SIGINT exploitation, only lightly touched on by [redacted]. This is the impact of increasing volumes of *exploited* SIGINT that inundate our customers. We cannot shrug our shoulders and say, "That's *their* problem. Ours is to get the worthwhile material published and distributed." That is like officials of the Ford Motor Company saying that the fact that the public wasn't buying their lovely Edsel was the public's problem. If we produce large quantities of lovely SIGINT that nobody has time to read, we're committing a sin. And we're committing a sin if we allow any lovely SIGINT to bloom unseen in stacks of unprocessed material. So what's to be done?

We must devise better ways to get SIGINT information to appropriate customers, keeping in mind that their processing shops worry about other sources as well, and are usually quite small. It's up to us to use our technology and smart ideas to avoid the two major sins of SIGINT exploitation -- publishing too much (beyond our customers' absorption limit) and failing to publish material that we have and they need. In pursuing a solution to this problem, we may have to trample on some cherished notions of how end-product is produced and disseminated.

Jack Gurin, R5

(C)

To the Editor, CRYPTOLOG:

How could the guy who translated your Latin-American geography quiz (CRIPTOLOGO, abril de 1978) be so dumb as to say "el.página 21"? Even I know that "page" is feminine, so it should be "la página 21."

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Editor's comment:

Just a typo! In other words, it wasn't "the dumb translator" (*tú*). It was "the dumb typist" (*yo*).

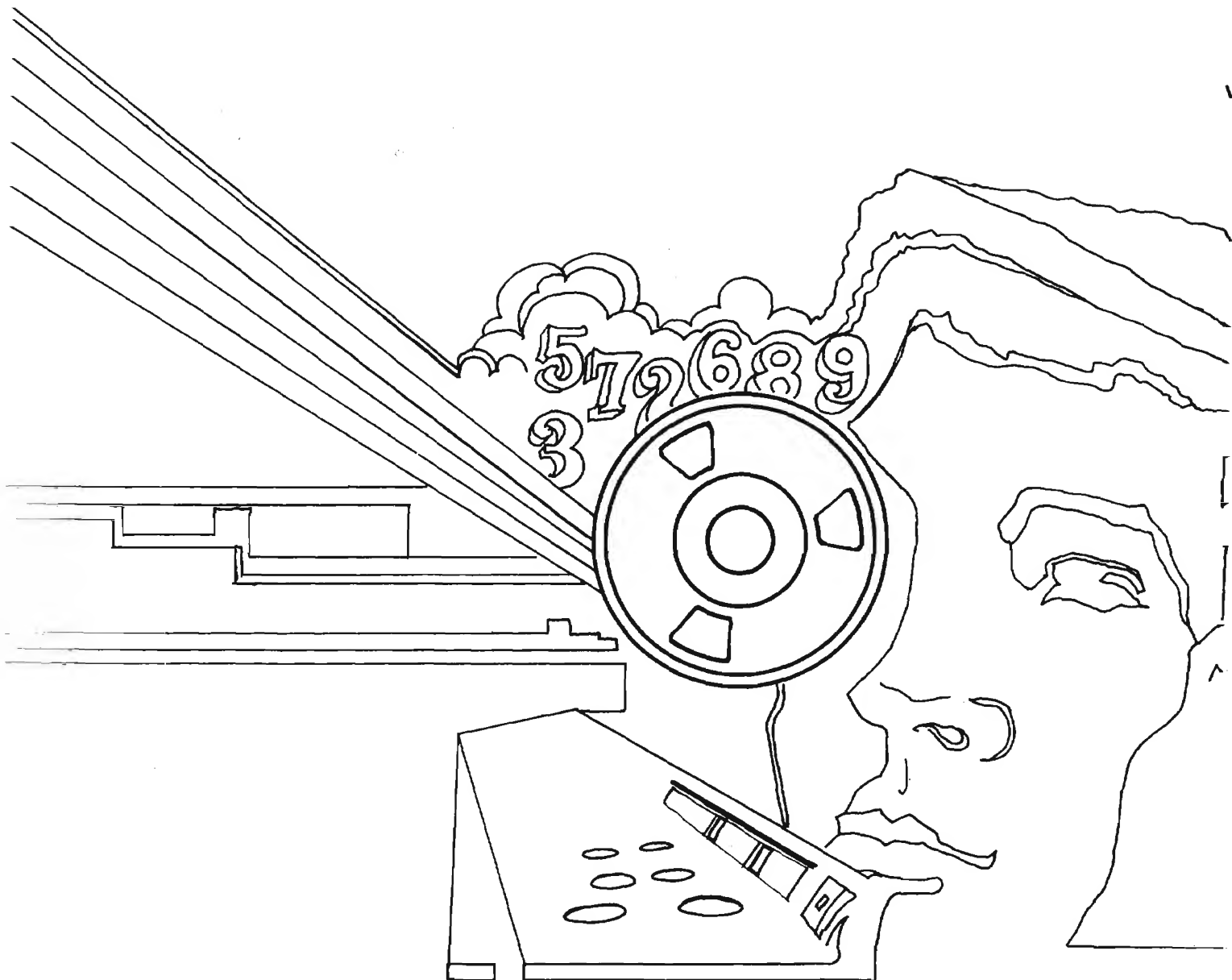
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To the Editor, CRYPTOLOG:

Delighted to see the lead article in the April 1978 CRYPTOLOG, "SIGINT Exploitation,

~~SECRET SPOKE~~

~~TOP SECRET~~



~~THIS DOCUMENT CONTAINS CODEWORD MATERIAL~~

~~TOP SECRET~~